

**WHAT IS CLAIMED IS:**

1. An isolated or purified nucleic acid molecule consisting essentially of a nucleotide sequence encoding human brother of regulator of imprinted sites (BORIS) or a fragment thereof comprising at least 1536 contiguous nucleotides.
2. The isolated or purified nucleic acid molecule of claim 1, which (i) encodes the amino acid sequence of SEQ ID NO: 2 or a fragment thereof comprising at least 307 contiguous amino acids, (ii) consists essentially of the nucleotide sequence of SEQ ID NO: 1 or a fragment thereof comprising at least 1536 contiguous nucleotides, (iii) hybridizes under highly stringent conditions to an isolated or purified nucleic acid molecule consisting essentially of the nucleotide sequence that is complementary to SEQ ID NO: 1 or a fragment thereof, or (iv) shares 45% or more identity with SEQ ID NO: 1.
3. An isolated or purified nucleic acid molecule consisting essentially of a nucleotide sequence that is complementary to either of a nucleotide sequence encoding human BORIS or a fragment thereof comprising at least 1536 contiguous nucleotides.
4. The isolated or purified nucleic acid molecule of claim 3, which (i) is complementary to a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2, (ii) is complementary to the nucleotide sequence of SEQ ID NO:1 or a fragment thereof comprising at least 1536 nucleotides, (iii) hybridizes under highly stringent conditions to an isolated or purified nucleic acid molecule consisting essentially of SEQ ID NO:1 or a fragment thereof, or (iv) shares 45% or more identity with the nucleotide sequence that is complementary to SEQ ID NO:1.
5. An isolated or purified nucleic acid molecule consisting essentially of a nucleotide sequence encoding a non-human BORIS or a fragment thereof comprising at least 229 contiguous nucleotides.
6. The isolated or purified nucleic acid molecule of claim 5, which (i) encodes the amino acid sequence of SEQ ID NO: 4 or a fragment thereof comprising at least 21 contiguous amino acids, (ii) consists essentially of the nucleotide sequence of SEQ ID NO: 3 or a fragment thereof comprising at least 229 contiguous nucleotides, (iii) hybridizes under moderately stringent conditions to an isolated or purified nucleic acid molecule

consisting essentially of the nucleotide sequence that is complementary to SEQ ID NO: 3 or a fragment thereof, or (iv) shares 23% or more identity with SEQ ID NO: 3.

7. An isolated or purified nucleic acid molecule consisting essentially of a nucleotide sequence that is complementary to either of a nucleotide sequence encoding a non-human BORIS or a fragment thereof comprising at least 229 contiguous nucleotides.

8. The isolated of purified nucleic acid molecule of claim 7, which (i) is complementary to a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:4, (ii) is complementary to the nucleotide sequence of SEQ ID NO:3 or a fragment thereof comprising at least 229 nucleotides, (iii) hybridizes under moderately stringent conditions to an isolated of purified nucleic acid molecule consisting essentially of SEQ ID NO:3 or a fragment thereof, or (iv) shares 23% or more identity with the nucleotide sequence that is complementary to SEQ ID NO:3.

9. A vector comprising the isolated or purified nucleic acid molecule of claim 1.

10. A vector comprising the isolated or purified nucleic acid molecule of claim 3.

11. A vector comprising the isolated or purified nucleic acid molecule of claim 5.

12. A vector comprising the isolated or purified nucleic acid molecule of claim 7.

13. A cell comprising the vector of claim 9.

14. A cell comprising the vector of claim 10.

15. A cell comprising the vector of claim 11.

16. A cell comprising the vector of claim 12.

17. An isolated or purified polypeptide molecule consisting essentially of an amino acid sequence encoding human BORIS or a fragment thereof comprising at least 307 contiguous amino acids, either one of which is optionally glycosylated, amidated, carboxylated, phosphorylated, esterified, N-acylated or converted into an acid addition salt and/or optionally dimerized or polymerized.

18. The isolated or purified polypeptide molecule of claim 17, which (i) is encoded by the nucleotide sequence of SEQ ID NO:1 or a fragment thereof comprising at least 921 contiguous nucleotides, (ii) consists essentially of the amino acid sequence of SEQ ID NO: 2 or a fragment thereof comprising at least 307 contiguous amino acids or (iii) shares 47% or more identity with SEQ ID NO: 2.

19. An isolated or purified polypeptide molecule consisting essentially of an amino acid sequence encoding a non-human BORIS or a fragment thereof comprising at least 21 contiguous amino acids, either one of which is optionally glycosylated, amidated, carboxylated, phosphorylated, esterified, N-acylated or converted into an acid addition salt and/or optionally dimerized or polymerized.

20. The isolated or purified polypeptide molecule of claim 19, which (i) is encoded by the nucleotide sequence of SEQ ID NO:3 or a fragment thereof comprising at least 63 contiguous nucleotides, (ii) consists essentially of the amino acid sequence of SEQ ID NO: 4 or a fragment thereof comprising at least 21 contiguous amino acids or (iii) shares 40% or more identity with SEQ ID NO: 4.

21. A cell line that produces a monoclonal antibody that is specific for a region of the isolated or purified polypeptide molecule of claim 17, wherein the region comprises any region that is recognizable by the monoclonal antibody other than one spanning a zinc finger region.

22. The monoclonal antibody produced by the cell line of claim 21.

23. A method of diagnosing a cancer or a predisposition to a cancer in a male mammal, which method comprises detecting either (i) a nucleic acid molecule comprising a nucleotide sequence encoding BORIS or (ii) a polypeptide molecule comprising an amino acid sequence encoding BORIS in a test sample comprising somatic cells obtained from the

male mammal, wherein the detection of (i) or (ii) in the test sample is indicative of the cancer or a predisposition to the cancer in the male mammal.

24. The method of claim 23, wherein the nucleic acid molecule comprising the nucleotide sequence encoding BORIS comprises SEQ ID NO:1.

25. The method of claim 23, wherein the polypeptide molecule comprising an amino acid sequence encoding BORIS comprises SEQ ID NO:2.

26. A method of predicting a predisposition to a cancer in an offspring of a male mammal, which method comprises detecting either (i) a mutation in a nucleic acid molecule comprising a nucleotide sequence encoding BORIS, (ii) a decreased level of a polypeptide molecule comprising an amino acid sequence encoding wild-type BORIS, or (iii) a mutation in a polypeptide molecule comprising an amino acid sequence encoding BORIS in a test sample comprising germ cells obtained from the male mammal, wherein the detection of (i), (ii), or (iii) in the test sample is indicative of the cancer or a predisposition to the cancer in the offspring of the male mammal.

27. The method of claim 26, wherein the nucleic acid molecule comprising the nucleotide sequence encoding BORIS comprises SEQ ID NO:1.

28. The method of any of claims 26, wherein the polypeptide molecule comprising an amino acid sequence encoding BORIS comprises SEQ ID NO:2.

29. A method of diagnosing a cancer or a predisposition to a cancer in a female mammal, which method comprises detecting either (i) a nucleic acid molecule comprising a nucleotide sequence encoding BORIS or (ii) a polypeptide molecule comprising an amino acid sequence encoding BORIS in a test sample obtained from the female mammal, wherein the detection of (i) or (ii) in the test sample is indicative of the cancer or a predisposition to the cancer in the female mammal.

30. The method of claim 29, wherein the nucleic acid molecule comprising the nucleotide sequence encoding BORIS comprises SEQ ID NO:1.

31. The method of any of claims 29, wherein the polypeptide molecule comprising an amino acid sequence encoding BORIS comprises SEQ ID NO:2.

32. A method of prognosticating a cancer in a mammal, wherein BORIS is a marker for the cancer, which method comprises measuring the level of BORIS in a test sample comprising somatic cells obtained from the mammal, wherein the level of BORIS in the test sample is indicative of the prognosis of the cancer in the mammal, and wherein the level of BORIS in the test sample is measured by comparing the level of BORIS in the test sample to the level of BORIS in another test sample obtained from the mammal over time, wherein a decrease or no change in the level of BORIS over time is indicative of a positive prognosis, and an increase in the level of BORIS over time is indicative of a negative prognosis.

33. A method of assessing the effectiveness of treatment of a cancer in a mammal, wherein BORIS is a marker for the cancer, which method comprises measuring the level of BORIS in a test sample comprising somatic cells obtained from the mammal, wherein the level of BORIS in the test sample is indicative of the effectiveness of treatment of the cancer in the mammal, and wherein the level of BORIS in the test sample is measured by comparing the level of BORIS in the test sample to the level of BORIS in another test sample obtained from the same mammal over time, wherein a decrease or no change in the level of BORIS over time is indicative of the treatment being effective, and an increase in the level of BORIS over time is indicative of the treatment being ineffective.

34. A method of treating a mammal prophylactically or therapeutically for cancer, wherein the cancer is due to the presence of (i) a nucleic acid molecule comprising a nucleotide sequence encoding BORIS or (ii) a polypeptide molecule comprising an amino acid sequence encoding BORIS, which method comprises providing an inhibitor of (i) or (ii) to the mammal in an amount sufficient to treat prophylactically or therapeutically the mammal for the cancer.

35. The method of claim 34, wherein the cancer is due to the presence of (i) and wherein an inhibitor of (i) is provided to the mammal by administering to the mammal an antisense or a ribozyme molecule specific for (i), wherein the antisense or ribozyme molecule inhibits (i) after being administered to the mammal.

36. The method of claim 34, wherein the cancer is due to the presence of (ii) and wherein an inhibitor of (ii) is provided to the mammal by administering to the mammal a

small molecule or an antibody specific for (ii), wherein the small molecule or antibody inhibits (ii) after being administered to the mammal.

37. A composition comprising an inhibitor of BORIS and a carrier.

38. The composition of claim 37, wherein the inhibitor of BORIS is a small molecule, and wherein the small molecule is present in the composition in an amount sufficient to inhibit BORIS.

39. The composition of claim 37, wherein the inhibitor of BORIS is an antibody, and wherein the antibody is present in the composition in an amount sufficient to inhibit BORIS.

40. The composition of claim 37, wherein the inhibitor of BORIS is an antisense molecule, and wherein the antisense molecule is present in the composition in an amount sufficient to inhibit BORIS.

41. The composition of claim 37, wherein the inhibitor of BORIS is a ribozyme molecule, and wherein the ribozyme molecule is present in the composition in an amount sufficient to inhibit BORIS.